

**REMARKS**

Claims 10, 11, and 13 were rejected as impertinent. Applicant requests reconsideration. It is elementary that the sun ejects electrons that are collected by earth's magnetic fields trapping electrons causing electrostatic charge accumulation on a surface. The claims have been accordingly amended. Claim 1, 10, 11, 13, and 16 were amended to particularly recite that the sun emits UV light, the sun ejects electrical charges, and that the curing resin is uncured resin that is cured upon exposure to UV light.

12       Claims 1-6, 10-11, and 13-16 were rejected as anticipated by  
13      AIAA. Applicant requests reconsideration. Claims 7-8 were rejected  
14      as unpatentable over AIAA. Applicant requests reconsideration.  
15      Claims 9 and 12 were rejected as unpatentable over AIAA in view of  
16      Amick. Applicant requests reconsideration. These rejections are  
17      without merit. The examiner stated that: 1) the AIAA reference  
18      includes authors, which do not match the inventorship of the  
19      present application; 2) the AIAA publication date is April 2003,  
20      and 3) the inventors were in possession of the invention as of a  
21      constructive date of the invention disclosure of December 2002.  
22      Applicant hereby swears behind the AIAA reference. Applicant  
23      supports true inventorship with the attached declaration of Edward  
24      J. Simburger.

26 The examiner cites 35 USC 102(a) stating that "the invention  
27 was known or used by others, or patented, or described in a printed  
28 publication in this or a foreign country BEFORE the invention

1 thereof by the applicant for patent. The AIAA reference is not a  
2 patent. The AIAA is a printed publication that was not printed  
3 before applicant's constructive reduction to practice in December  
4 2002, as acknowledged by the examiner. The question remaining is  
5 whether the invention was "known or used" by others before the  
6 invention thereof. The use must be a public use. There is no  
7 evidence of record that the present invention was in public use or  
8 in any use whatsoever. Advance "known" knowledge before invention  
9 is, of course, an impossibility as it was the inventors who  
10 confidentially disclosed the invention to the NASA administrators,  
11 the non-co-inventor authors. The "others" as apparently implied by  
12 the examiner appear to be those non-inventors listed as authors in  
13 the AIAA publication. The knowledge by others must be public and  
14 general, in that, a few are not deemed by the court to have the  
15 hallmark of "public accessibility", especially those few under an  
16 obligation not to disclose. Where "others" are limited in number to  
17 a few or that the knowledge is non-public, particularly under  
18 confidentiality agreements not to disclose, such knowledge of the  
19 invention by others, kept secret by those few, is not "generally"  
20 known by others, as there is a lack of the necessary amount of  
21 "public accessibility". Here, the non-co-inventor authors are a few  
22 defeating the anticipation rejection under 102. Here, the non-co-  
23 inventor authors were under a confidentiality agreement, and hence,  
24 their knowledge is not public knowledge necessary for "public  
25 accessibility". Here, the non-co-inventor authors necessarily  
26 understood the invention ONLY AFTER the present invention inventors  
27 disclosed the present invention to the NASA administrator as part  
28 of the contract for hired work. On each of these three separate and

1 distinct counts, the rejection under 102(a) fails. The AIAA  
2 publication is not prior art to the present application. The AIAA  
3 publication cannot be used to form anticipation rejections or  
4 obviousness rejections. Applicant takes exception pending appeal.  
5

6 Claims 1, 13, and 16 were rejected as anticipated by Wallsten.  
7 Claim 3 was rejected as unpatentable over Wallsten in view of  
8 Struble. Claims 10-11 and 15 were rejected as unpatentable over  
9 Wallsten in view of Struble in view of Dever. Claim 12 was rejected  
10 as unpatentable over Wallsten in view of Kaji in view of Minahan.  
11 Applicant requests reconsideration.  
12

13 The present invention uses an inflatable hinge, that when  
14 inflated determines, the angular displacement between two movable  
15 flat panels attached to the hinge. More particularly, the present  
16 invention includes a top film having a top circumferential length,  
17 the bottom film having a bottom circumferential length, the top and  
18 bottom circumferential lengths for angularly positioning the left  
19 and right panels.

20  
21 Independent Claims 1 and 13 were rejected as anticipated by  
22 Wallsten. Wallsten teaches that an inflatable air bag can be  
23 deployed assisted by a network of internal inflatable cylinders,  
24 which are interconnected forming a frame, such that when inflated,  
25 the air bag takes on the shape of a bag, such as an automobile air  
26 bag. Wallsten teaches a network of inflatable cylinders or channels  
27 as a frame that can be attached to the inside of an air bag to  
28 assist in deploying the air bag.

1 Wallsten does not teach using a flex circuit, does not teach  
2 using wrap around contacts, does not teach a left frame with  
3 adhesive, does not teach a right frame with adhesive, does not  
4 teach a coating over the right film and left film, does not teach a  
5 sublimation powder, does not teach a hinge interconnecting panel,  
6 does not teach panels, does not teach hinges, does not teach using  
7 films to define the positioning of the panels; does not teach a  
8 hinge having two panels that move independently of each other, and  
9 does not teach a coating layer to define the positioning between  
10 two panels. Wallsten teaches an air bag, which does not deploy into  
11 any form of permanent structure after deployment.

12

13 Wallsten teaches an air bag having a continuous outer periphery.  
14 The air bag has no panels whatsoever. A panel being a flat planar  
15 piece. The examiner is in error when asserting that Wallsten  
16 teaches air bag panels.

17

18 Wallsten teaches an air bag, teaches a network of inflatable  
19 channels functioning as a frame within the walls of an air bag,  
20 teaches channels disposed attached to the bag's interior walls, and  
21 teaches using a frame of channels to define the periphery inflation  
22 level of an air bag. More particularly, Wallsten uses an air bag,  
23 that when inflated, has a predetermined size. Wallsten's  
24 predetermined air bag size determines the curvature of the bag  
25 walls. The curvature is continuous about the air bag. The examiner  
26 is in error when asserting that Wallsten's frame determines the  
27 position between two panels, which of course, do not even exist.

28 ///

1 Wallsten teaches an air bag internally supported by a frame  
2 attached to the interior walls of the air bag. The air bag defines  
3 the periphery surface of the air bag. More particularly, Wallsten  
4 uses an air bag, that when inflated, has a predetermined size.  
5 Wallsten's predetermined air bag size determines the curvature of  
6 the bag walls. The curvature is continuous about the air bag. As  
7 the bag inflates, the bag skin forms an inflated balloon consisting  
8 of a continuous surface. As such, the continuous surface is not  
9 segmented into independently movable panels that can rotate about a  
10 hinge. The examiner is in error when asserting that Wallsten's  
11 frame is a hinge.

12

13 Wallsten teaches an air bag supported by an inflatable frame  
14 within the walls of the air bag. The size of the air bag defines  
15 the peripheral surface of the air bag. More particularly, Wallsten  
16 uses an air bag, that when inflated, has a predetermined size. The  
17 frame channels are made of a top film and a bottom film. Like the  
18 bladder of the present invention, Wallsten's frame can be inflated  
19 using a sublimation powder. As the frame inflates, the bag  
20 inflates, as the curvature of the bag walls are defined by the size  
21 of the bag. It is very clear that the dimensions of the films used  
22 to make the inflatable frame channel in no way determines the  
23 positioning of anything, let alone phantom panels, which are not  
24 shown anywhere in Wallsten, let alone by and about phantom hinges.  
25 The frames, which are not hinges, are merely attached to the  
26 internal walls of the bag to give the bag support and aid in  
27 inflating the bag. The channels assist in inflation, and their  
28 circumferential lengths do not in anyway determine the curvature of

1 the air bag, let along phantom panels. It is the bag size, that is,  
2 the size and shape of the bag that determines the size and shape of  
3 the bag. The circumferential length of the channel does not  
4 determine anything, but merely provides an inflation channel. The  
5 top film and the bottom film of Wallsten's frame do not in anyway  
6 define the curvature of the bag, but merely support the bag having  
7 a predetermined size that then defines the size and curvature of  
8 the bag. Hence, the channel length is used to provide support for  
9 the bag, and the bag size determines the curvature of the bag,  
10 which is continuous about the air bag without any panels. As the  
11 bag inflates, the bag skin forms a balloon consisting of a  
12 continuous surface having a radius defined by the size of the bag.  
13 As such, the continuous surface is not segmented into independently  
14 movable panels that can also rotate about a hinge. Wallsten's frame  
15 does not in anyway determine the curvature of the bag, or any  
16 positions of the panels, as Wallsten's has no panels, and has no  
17 hinges. The examiner is in error when asserting that Wallsten's  
18 frame has top and bottom films that determine the positions of the  
19 non-existent panels.

20

21 Wallsten clearly uses the air bag, which is not an approximate  
22 sphere made of panels but is a bag having a continuous surface.  
23 Wallsten does not have anticipatory panels but only walls of the  
24 air bag disposed between and under the channels of the frame. The  
25 diameter and pressure of the air bag define the positions of the  
26 surface of the air bag. The frames do not define the positions of  
27 the walls, as hinges, which they are not, as nothing is rotating  
28 about them, which walls can flex up to 180 degrees determined by

1 the diameter of the air bag, and not the top and bottom film layers  
2 of the frame channels. Claim 1 is not anticipated by Wallsten at  
3 least because Wallsten does not have panels and does not use top  
4 and bottom layers of the hinges, and there are no hinges, for  
5 defining the angular position of the non-existent panels. The  
6 examiner is in error when asserting that Wallsten's frame defines  
7 the positions of "left and right" panels.

8

9       Claim 13 includes the UV limitation that a coating disposed  
10 over the top film is for passing the UV light for curing the  
11 uncured resin and for static discharge protection of the film.  
12 Claim 13 was rejected as anticipated by Wallsten indicating that  
13 the resin limitation is a product by process. It is clear that the  
14 present invention uses an UV transparent coating to cure a polymer  
15 risen for rigidity from an uncured state to a cured state. Wallsten  
16 has no such function, but rather only relies upon air pressure and  
17 strong elastic properties of the material to keep the air bag  
18 inflated. Exemplar reliance upon a product by process is misplaced.  
19 The uncured resin is in an uncured state before UV on-orbit  
20 exposure and a cured state when on-orbit. The "uncured resin",  
21 indicates the state of the resin, as the device is being used and  
22 deployed, and not the making of the curing resin. The product is  
23 complete when launched having uncured resin in an uncured state.  
24 When deployed, the soft uncured resin changes its shape as well as  
25 the physical property of the resin. Nothing is being made on orbit  
26 as the uncured resin was disposed in the device, and is part of the  
27 finished device when made. Just like a transistor being turned on  
28 and off, the resin has two states, uncured and cured, during normal

1 use. A solar cell degrades in space over time, yet, the solar cell  
2 in this degraded state "is not being made" by anyone, and the  
3 product is defined and made prior to use. There are no laboratory  
4 assistants attached to the satellite on orbit and floating in  
5 orbit, with a little UV lamp, curing the resin, before the product  
6 is used. It is the apparatus itself that is transforming itself due  
7 to the preexisting design. The uncured resin is a resin in the  
8 uncured state before launch, and after unfurling, becomes cured by  
9 virtue of the action of the unfurling and exposure to UV light.  
10 There is no process step being claimed. This is not a product by a  
11 process, as both the uncured and cured states of the resin are  
12 contemplated during use. Wallsten does not anticipate claim 13 at  
13 least because Wallsten does not disclose the use of an uncured  
14 resin, which has two states when in use, a first uncured state and  
15 a second cured state, as is apparent from a reading of claim 1 of  
16 the present invention. The examiner is in error when suggesting  
17 that Wallsten teaches an uncured resin that is cured by UV exposure  
18 to rigidize the hinge to permanently secure panels in position.  
19 Applicant takes exception pending appeal that Wallsten neither  
20 anticipates nor in combination renders unpatentable the present  
21 invention.

22  
23  
24 Wallsten does not teach a hinge, does not teach panels, does not  
25 teach top and bottom films defining positions, does not teach top  
26 and bottom films defining the positions of panels, does not teach  
27 encapsulated uncured resin for rigidizing a hinge, does not teach  
28 encapsulated uncured resin cured by UV light for rigidizing a

1 hinge, does not teach encapsulated uncured resin cured by UV light  
2 for rigidizing a hinge for securing panels in position, does not  
3 teach wrap around contacts, and does not teach flex circuits. Yet,  
4 Wallsten is used incorrectly by the examiner as a primary reference  
5 for both anticipation and obviousness rejections. This is  
6 remarkable.

7

8       In connection with claim 3, sublimation powders, as in  
9 Struble, have been used for inflating inflation devices. In  
10 connection with claim 15, tin-Oxide coatings, as in Dever, have  
11 been used for anti-static discharge. In connection with claim 12,  
12 wrap around contacts, as in Minahan, have been used for  
13 interconnecting. However, the use of sublimation powders, tin-oxide  
14 coatings, and wrap around contacts are elements used as supplements  
15 to the novel combination of features of the present inventions.

16

17       Struble at least is directed to space applications. Struble  
18 teaches that a large structure can be deployed in the space  
19 environment by inflating a series of inflatable cylinders, which  
20 are tied together at the ends to form a predetermined structural  
21 shape. This is redundant to Wallsten. Struble teaches that a  
22 permanent shape can be obtained by elongation of the aluminum  
23 coating beyond its yield strength thus thereby giving the aluminum  
24 or wire braid a permanent set in space. The present invention  
25 departs using uncured resin to provide rigidity after deployment.

26

27       Struble does not teach the use of an inflatable cylindrical  
28 bladder for deploying adjacent panels to permanent positions after

1 deployment. Struble does not teach the use of an uncured polymer  
2 resin for obtaining a permanent position in space. Struble does not  
3 teach that one could fashion a hinge where the angle of rotation  
4 can be preset by having fixed attach points around an inflatable  
5 cylinder. Struble does not teach that a structure composed of an  
6 electrical insulator needs to be protected from electrostatic  
7 discharge from exposure to the space environment. Struble's  
8 structure is coated with aluminum, which is conducting and  
9 necessary for reflecting radio waves. Thus, Struble's structure  
10 cannot use a rigidizing technology, which requires the exposure of  
11 interior layers to ultra violet light, and hence, the present  
12 invention departs from Struble's teachings.

13

14 By contradistinction, the present invention uses an inflatable  
15 bladder to rigidly position movable panels. The present invention  
16 overcomes the limitations of Struble and Wallsten when forming  
17 rigidized panels in space. The inflation gas provides the kinetic  
18 energy to move the adjacent panels from the stowed position to the  
19 permanent deployed position by virtue of the attachment of the  
20 hinge to the panels along top and bottom films having predetermined  
21 circumferential lengths. The inflated bladder has films that  
22 function for determining the final shape of the hinge and the  
23 relative positions between the two panels during the rigidization  
24 process.

25

26 Wallsten does not teach that an inflatable cylinder can be  
27 used for presetting the final position of two independent movable  
28 panels through an inflatable cylinder for determining the final

1 shape of a hinge and relative positions of the two panels with  
2 respect to one another. Wallsten does not teach the use of an  
3 uncured resin-filled fiberglass reinforced structural element in  
4 the stowed position. Wallsten does not teach final curing of the  
5 resin-filled structural element for rigid deployment of side  
6 panels. Wallsten and Struble do not teach or suggest alone or in  
7 combination the present inventions.

8

9       Claims 1-9 and 14 were rejected as unpatentable over Kaji in  
10 view of Struble. Claims 13 and 16 were rejected as anticipated by  
11 Kaji. Applicant requests reconsideration.

12

13       The examiner's rejection of claim 13 based upon Kaji is  
14 misguided. Kaji teaches a rod having a predetermined diameter,  
15 around which is disposed a flex circuit to form a bend in a flex  
16 material extending between two panels. The rod does not determine  
17 the angle of bend. The rod is used to form a bend with that  
18 diameter so that the flex bend is round and large conforming to the  
19 rod, so that the flex bend is too small and does not mechanically  
20 weaken the bend leading to cracks and mechanical failure of the  
21 bend. The rod in Kaji does not determine the angular bend, but only  
22 determines the radius of the bend to prevent breakage at the bend.

23

24       Struble teaches a sublimation powder in a tube for erecting a  
25 frame, but Struble does not teach inflating a hinge made of a  
26 bladder for erecting and positioning panels relative to each other  
27 as there are no panels and no hinges in Struble. Struble is merely

1 a prior art teaching that sublimation powders can be used to  
2 inflate.

3

4 The combination of Kaji and Struble is impractical along the  
5 lines of the present invention. There is no way practical to  
6 combine Struble frames as hinges, because frames do not allow for  
7 the moving of independent panels. The combination of Kaji's rods  
8 that define a radius to prevent breakage and Struble's inflated  
9 frame does not include layers for defining the angular position of  
10 deploying and moving panels. Kaji describes a method of protecting  
11 flexible solar cell interconnects by inserting a metal rod at the  
12 point where the interconnects will be bent when folding up the  
13 solar array panels. The purpose of the metal rod is to prevent the  
14 bending radius of the interconnects from being reduced below that  
15 which the interconnects can withstand without sustaining structural  
16 damage by the act of folding up the solar array. Kaji does not use  
17 or teach that the cylindrical rod is used to set the amount of  
18 rotation of the panels to a specific predetermined angle after  
19 unfolding.

20

21 Kaji does not teach the use of an uncured epoxy resin to  
22 permanently preset at a deployed angle by curing a resin after  
23 deployment. The conductive epoxy of Kaji is the method that is used  
24 to make the connection between the interconnects and the solar  
25 array panels. The epoxy has nothing to do with the rigidizing the  
26 deployed panels in a permanent predetermined fixed position after  
27 deployment. Kaji teaches that the panels can be folded and unfolded  
28 an unspecified number of times and there is no preset deployment

1 angle. Hence, Kaji teaches away from the use of any resin for  
2 setting the positions between two panels. Claim 13 recites that the  
3 hinge is used for permanently positioning the panels.

4

5 Because Kaji's application is a hiking backpack and not a  
6 space system, Kaji did not anticipate that there might be  
7 additional layers or coatings that must be applied to the device to  
8 allow the transmittance of ultraviolet light while protecting the  
9 device from harmful static discharge through insulating materials  
10 when bombarded by electrons which originate from the sun. Kaji  
11 teaches that one can use a cylindrical rod to prevent the bending  
12 of interconnects between solar array panels beyond the minimum bend  
13 radius of the interconnect material. Kaji does not teach that an  
14 inflatable cylinder can be used for presetting the final positions  
15 of two independent panels through the use of an inflatable cylinder  
16 used for determining the final shape of a hinge and the relative  
17 positions of the two panels with respect to one another. Kaji does  
18 not teach the use of an uncured resin-filled fiberglass reinforced  
19 structural element in the stowed position. Kaji does not teach  
20 final curing of a resin-filled structural element using the hinge  
21 as a curing mold after deployment.

22

23 The examiner's apparent tortured reasoning from a somewhat  
24 strong imagination seems to enable anyone to combine Kaji's  
25 backpack solar array, with Wallsten's automobile air bag, with  
26 Struble's large deployable radio reflector, to reject the present  
27 invention contrary to the teachings of cited references. The bag of

1 disjointed parts rejection is prima facie evidence of  
2 nonobviousness.

3

4       Claims 10-11 and 15 were rejected as unpatentable over Kaji in  
5 view of Struble in view of Dever. Dever teaches a tin-oxide and  
6 magnesium-fluoride material for passing UV light and conducting  
7 static charge. Dever does not teach using a layer that can be used  
8 for static discharge, that is also for passing UV light that  
9 functions to cure uncured resin. There is no suggestion in Kaji,  
10 Struble, or Dever to use hinge layers for defining the position,  
11 for static discharge, and for locking the panels into that position  
12 using an uncured resin cured through UV exposure.

13

14       Claim 12 was rejected as unpatentable over Kaji in view of  
15 Struble in view of Minahan. Minahan teaches wrap around contacts  
16 for solar cells. There is no suggestion in Kaji, Struble, or Dever  
17 to use hinge layers for defining panel positions and a curing resin  
18 for locking the panels into those positions. There is no teaching  
19 in Minahan to pass electrical wires around an inflatable hinge  
20 having defined positions.

21

22       Claim 1 claims an inflatable bladder and top and bottom films  
23 extending between panels with the top and bottom films defining the  
24 angular positioning. Claim 13 claims a top film defining the  
25 angular positioning between two panels and a curing resin cured by  
26 passing UV light through a static discharge layer. Cited references  
27 do not teach or suggest an inflatable hinge for moving panels to  
28 panel positions, do not teach or suggest an inflatable hinge having

1 cover layers for determining the panel positions, do not teach or  
2 suggest a curing resin for locking the panels into the panel  
3 positions, and do not teach a UV static discharge layer for passing  
4 UV light to the curing resin for rigidizing the hinge for securing  
5 the panels into the panel positions. This case being in good  
6 condition for appeal or allowance, allowance of the claims is  
7 requested.

8

9 Respectfully Submitted

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